Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	CC Docket No. 94-102
To Ensure Compatibility with	)	RM-8143
Enhanced 911 Emergency	)	
Calling Systems	)	
	)	
Request for Waiver of	)	DA 98-2631
Section 20.18(e) of the	)	
Commission's Rules	)	

AMERITECH'S
REQUEST FOR WAIVER

Pursuant to the guidelines issued by the Wireless Telecommunications Bureau on December 24, 1998 ("Public Notice"), Ameritech hereby applies for a waiver of Section 20.18(e) of the Commission's E911 rules in order to consider the option of a handset-based approach to Phase II Automatic Location Identification ("ALI") requirements. While Ameritech has not yet determined which technology it will use to comply with the Commission's E911 location mandate, Ameritech requests this waiver in order to reserve the option of using a handset-based technology.

I. INTRODUCTION

The Bureau has stated that "application for or grant of a waiver does not obligate the carrier to use the waiver; if a carrier wishes, it may decide to comply with the rules in effect rather than employ a granted waiver." Public Notice at 5. However, if the Bureau

does grant, and Ameritech chooses to employ the requested waiver, Ameritech commits to meeting the criteria set forth in this request.

This filing requests a waiver under which Ameritech would provide location information as required by Section 20.18(e) [1] in a phased-in implementation schedule rather than the flash-cut contemplated by the rule. Specifically, Ameritech requests that the Bureau consider Ameritech to be in compliance with Section 20.18(e) if it:

1) works in good faith with manufacturers of location-enabled handsets to create a reasonable phased-in deployment plan prior to deployment of a location-enabled handset solution. Such a plan may include a mix of handset-based and network-based solutions within Ameritech's coverage area;

2) utilizes a handset-based solution that meets a two-dimensional location accuracy standard of 90 meters with 67 percent confidence; and

3) undertakes an active program to promote awareness of the availability and public safety benefits of location-enabled handsets.

This request is consistent with the Commission's goals in this E911 proceeding and is in the public interest. By granting this waiver request, the Bureau will enable Ameritech to weigh the benefits of both handset-based and network-based location technologies for both Ameritech and public safety, and to rationally choose among all available technologies.

II. A WAIVER IS IN THE PUBLIC INTEREST

While Ameritech has yet to determine which technology it will use to meet the Commission's E911 Phase II requirements, without the requested waiver Ameritech will have no choice. As the Bureau has noted, the Commission has recognized "concerns that the effect of Section 20.18(e) might not be technologically and competitively neutral for

some technologies that might be used to provide ALI, in particular handset-based technologies such as those using the GPS satellite system." Public Notice at 1. Because of the flash-cut nature of the Phase II implementation contemplated by Section 20.18(e), Ameritech shares those concerns.

Granting this waiver request and adopting a technologically-neutral framework for Phase II compliance is in the public interest. Ameritech will be able to make its technology decision based on the benefits to public safety, the performance of the technology, and economic factors rather than on the artificially-limited technological options permitted by the current regulatory scheme. Ameritech will select the technology that it believes will provide the best service for people who call 911, which is the core purpose of the Commission's E911 requirements.

Ameritech is committed to achieving the goals of Section 20.18(e) and plans to make its decision on how best to do so in the near future. Current plans include a Request For Information ("RFI") to be completed and issued in 2Q99. Trials of the available technologies (both network and handset-based) will be carried out as part of the RFI analysis in 3Q99. Ameritech expects a Request For Proposal to be completed and issued in 4Q99. A business award and course of action will be determined as soon as possible thereafter. Ameritech will either meet the specific requirements of the rule or meet the standards set forth in this waiver request. Either way, Ameritech will set in place a program to provide Public Service Answering Points ("PSAPs") with timely, accurate information on the location of emergency callers. If factors outside of Ameritech's control (such as the actual performance of the chosen technology or manufacturers' production times) appear likely to prevent Ameritech from meeting either

[1] 47CFR § 20.18(e).

the standard in the requested waiver or the standard in the current rule, Ameritech will notify the Bureau as soon as possible in order to address any such problems.

III. WAIVER STANDARDS

In essence, Ameritech requests that it be considered in compliance with the E911 rule if it selects a handset-based approach. Under a waiver as requested by this pleading, Ameritech would provide better location accuracy and begin deployment earlier than required by Section 20.18(e). Ameritech would phase in full deployment of ALI capability at a rate determined by the turnover of handsets in the marketplace.

A. Improved Accuracy

As the Bureau notes in its Public Notice, "one of the most critical factors in providing help to 911 callers in emergency situations is the accuracy of the location information." Public Notice at 3. Under the requested waiver, Ameritech would provide PSAPs with ALI that meets or exceeds the accuracy requirements of the Commission's rules.

If Ameritech receives and employ the requested waiver, Ameritech could meet a two-dimensional location accuracy standard of 90 meters with 67 percent confidence on those wireless handsets equipped with the handset-based location technology. This exceeds the accuracy specified by the Commission's rule, which requires carriers to meet a standard of only 125 meters RMS.

In response to the Bureau's request, Exhibit A to this application provides field test data showing that at least one technology has exceeded this level of accuracy. The data includes results in various geographical environments, including urban canyons,

suburban and rural locations, mountainous and other similar terrain, and inside buildings, as requested by the Bureau. Public Notice at 4.

B. Minimizing Roamer Problems

"Roamer" problems will exist only in limited circumstances. There will be no roamer difficulties where the user roams to the service area of a carrier with a network-based solution, regardless of whether the user's phone is location-enabled or not. There are no roamer problems for a user who has a location-enabled phone and roams to the service area of a carrier that has adopted a handset-based solution. Roaming problems may exist when a user with a non-location-enabled handset roams to the service area of a carrier that employs a handset-based solution, or when a user with a location-enabled handset roams to the service area of a carrier that employs an incompatible handset-based solution. Roaming within the context of the chosen method used for location determination is summarized in the following matrix. The matrix is independent of air interface, band, frequency, and carrier.

Handset Type	Carrier using Network-based Location Solution	Carrier using Handset-based Location Solution
Location Solution	No roaming problem	Possible roaming problem
Not Location-enabled	No roaming problem	Roaming problem

To the extent that there is any roaming problem, it will become less significant over time. Ameritech expects that both chip and handset manufacturers will include

location technology in virtually all handsets as quickly as possible, in order to realize integration economies of scale. As a result, as in-service handsets are replaced through operation of market forces, there will be progressively fewer handsets that are not location-enabled, regardless of the ALI technology chosen by any particular carrier.

Ultimately, current and expected standards efforts will have the most impact on reducing roaming issues. For example, the North American GSM Alliance is proceeding as a group to standardize location technologies. Thus, a GSM subscriber who roams from Atlanta (e.g., BellSouth) to Seattle (e.g., Western Wireless) would enjoy the same location services in both venues. The CDMA Development Group and the Universal Wireless Communications Consortium are each similarly pursuing standardization of location technologies for their respective air interfaces. Interoperability between digital air interfaces is not required, as current technology does not enable roaming among them.

The Bureau has requested "any available information regarding the volume of 911 calls made by roamer customers in the carrier's service area". Public Notice at 4. Exhibit B attached hereto provides the total volume of 911 calls and those made by roamer customers within Ameritech's cellular market areas.

C. The Rate of Handset Deployment

If Ameritech employs the requested waiver, it will work with manufacturers of location-enabled handsets to create a reasonable phase-in deployment plan prior to deployment of a location enabled handset solution. Such a plan may include a mix of handset-based and network-based solutions within Ameritech's coverage area.

The Bureau specifically requested comment on the "[s]teps the carrier will take with respect to minimizing problems associated with non-ALI capable handsets." Public

Notice at 4. As noted above, Ameritech expects market forces will ensure that customers will continue to turn over their handsets rapidly and that as a result, any such problems will be relatively short-lived. Ameritech estimates a turnover rate of 700,000-800,000 handsets a year. As part of the requested waiver, Ameritech would aid the natural operation of the market by actively educating the public and promoting the safety benefits of location-enabled handsets.

Ameritech strongly urges the Bureau to rely upon market forces and carrier promotional efforts to deploy location-enabled handsets, rather than requiring carriers to affirmatively replace or upgrade non-enabled handsets. If the Bureau were to adopt such a non-market-based approach, the additional cost to carriers and PSAPs (to the extent that PSAPs reimburse carriers) would likely be so great as to practically eliminate any handset-based alternative from consideration. For example, Ameritech estimates that providing location-enabled handsets for only 20 percent of U.S. wireless customers would cost in excess of $3 billion, some of which may be underwritten by the public safety community itself. Elimination of the handset alternative would mean forgoing the improved accuracy and phased-in deployment that this waiver request contemplates. In short, Ameritech believes that the financial and public safety costs of overriding market forces to address any "problems associated with non-ALI capable handsets" are likely to prove worth the marginal gain that would result from such a requirement in the short term.

IV. CONCLUSION

Ameritech strongly endorses the public safety goals of the Commission's Phase II E-911 requirements and will continue to work to ensure that they are met. In order to facilitate this effort, Ameritech requests that the Bureau grant a waiver as described above to provide Ameritech with the widest range of technological options possible, including a handset-based solution. If the Bureau grants and Ameritech employs this waiver, the public will benefit from deployment of the most informed technological and economical ALI solution. For all of these reasons, Ameritech urges the Bureau to expeditiously grant this application.

Respectfully submitted,

Frank Michael Panek
Attorney for Ameritech
4H84
2000 W. Ameritech Center Drive
Hoffman Estates, IL 60196
847-248-6064

Dated: February 4, 1999

Exhibit A – Field Test Data
Exhibit B – Number of Roamer Calls to 911

Exhibit A

Field Testing Overview

- Extensive testing in the SF Bay Area, Denver (audited), Tokyo (audited), Kyoto (audited)
- Full range of outdoor environments: freeway, suburban, deep urban canyon
- Broad cross-section of indoor environments: high-rise, commercial, residential, brick, glass/steel
- System tested at speed in vehicle with GPS antenna inside at passenger head height
- End-to-end E9-1-1 field trial
  - >650 test calls; 100% correctly routed (based on SnapTrack-determined location)
  - partnered with SignalSoft, SCC, U S WEST Wireless, two Denver-area PSAPs

SnapTrack

Summary Results: Denver Testing

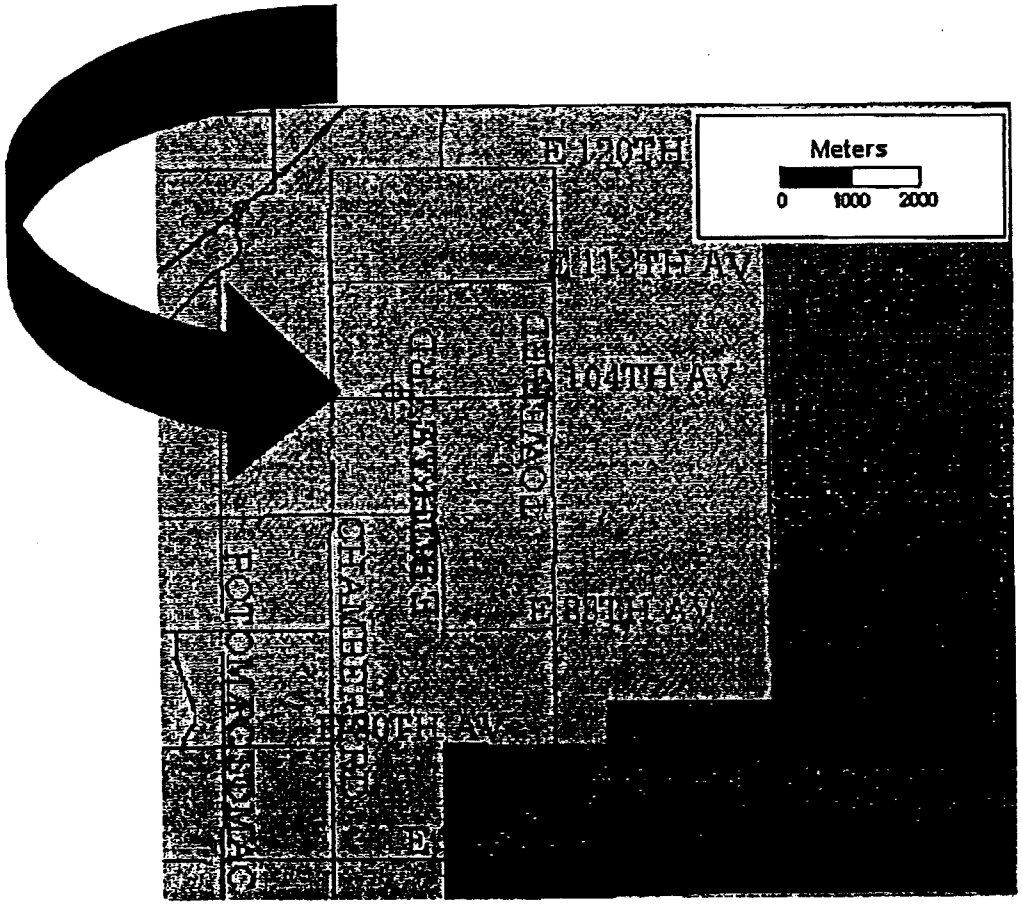
Location	Garmin Results	SnapTrack Single Sample Results					
		Fixes	Attempts	Percent Yield	1 sigma 68.3% CEP meters	2 sigma 95% CEP meters	Max Error meters
Indoor, 2 story residence (wood frame) 3707 W 98th place, 1st floor interior hall	no fix	106	106	100%	21	35	72
Indoor, 2 story residence (wood frame) 3707 W 98th place, center of basement	no fix	33	33	100%	20	*	60
Indoor, 2 story residence (wood frame) 627 Marine, center of basement	no fix	36	37	97%	16	*	50
Indoor, 2 story office building (Brick) 2045 Broadway, 2nd floor interior hallway	no fix	110	110	100%	17	36	66
Indoor, 2 story office building (Brick) 2045 Broadway, 1st floor interior room	no fix	34	36	94%	22	*	79
Indoor, Shopping Mall Westminster Mall, Denver	no fix	27	27	100%	36	*	133
Indoor, Shopping Mall Aurora Mall, Aurora (Denver)	no fix	31	39	79%	44	*	168
Indoor, 50 story office building (Glass/Steel) 1801 California, 21st Floor 4.4 m from window	no fix	32	36	89%	84	*	231
Outdoor, urban canyon street level (mid block) Curtis street between 16th and 17th, Denver		120	120	100%	45	113	247
(Supplemental reference sites)							
Outdoor, urban canyon Parking Garage Roof		57	57	100%	18	*	47
Outdoor, open site 71st and Winchester Circle		16	16	100%	4	*	5

* Insufficient data to calculate 2 sigma value
** 5 Sample average not calculated

Altitude data collected but not tabulated

SnapTrack

Single Cell Site Problem

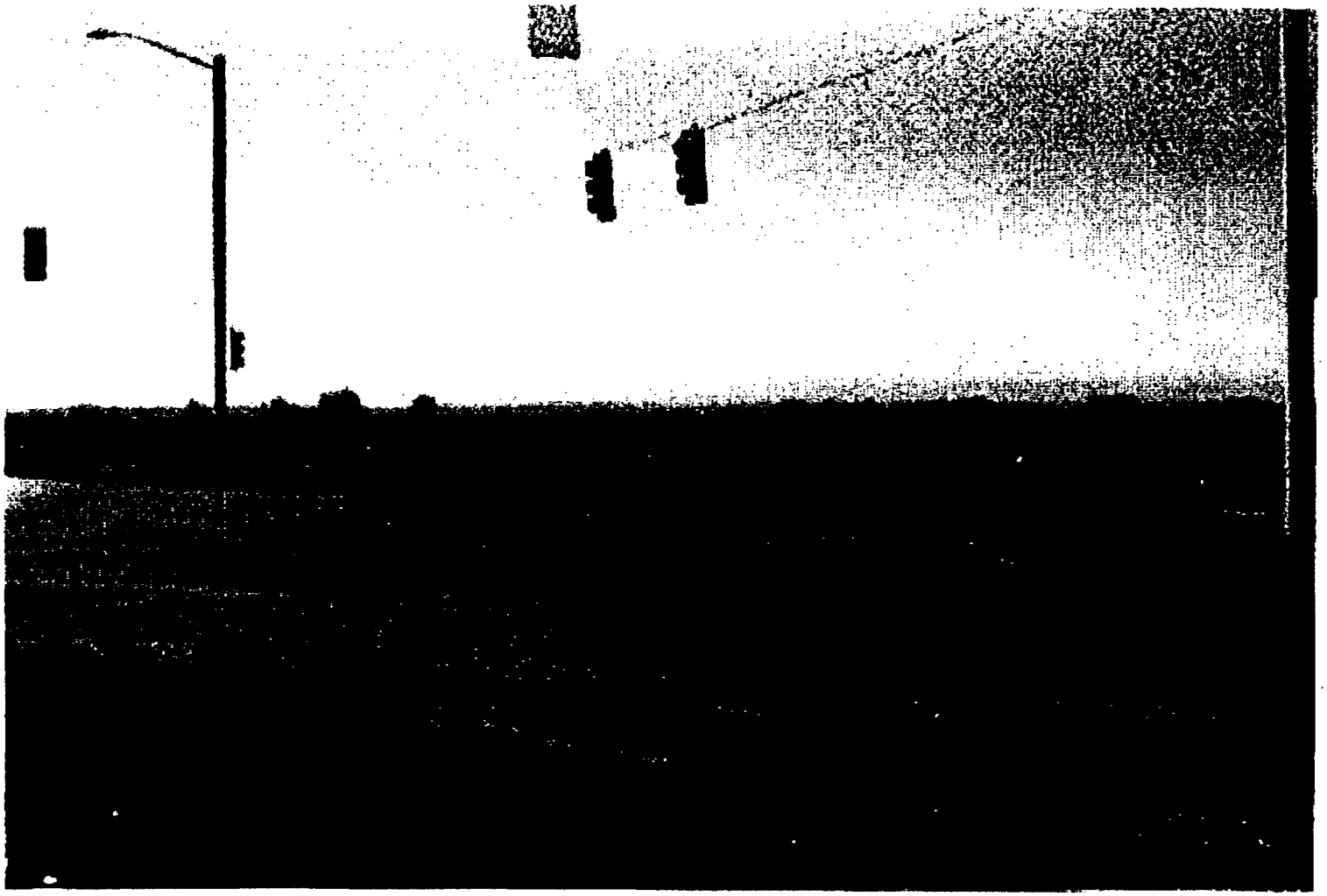


Network location solutions rely on "triangles of towers" - cellular base stations are not deployed in triangles!

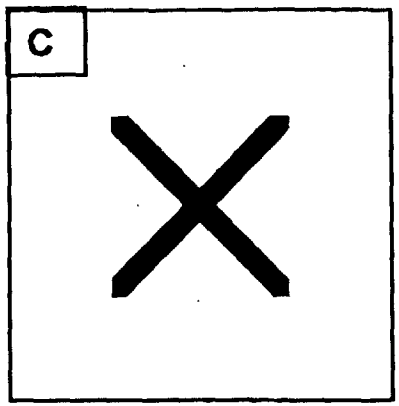
SnapTrack

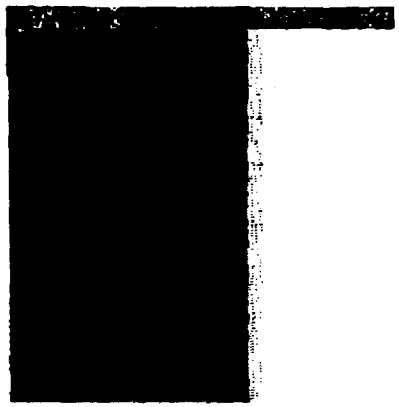
SnapTrack

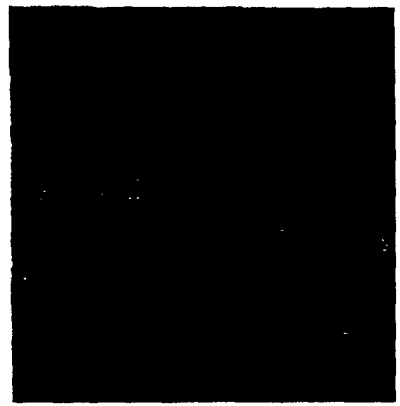
Adams County, CO (Rural)

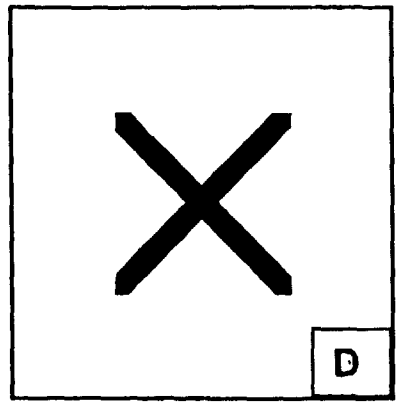


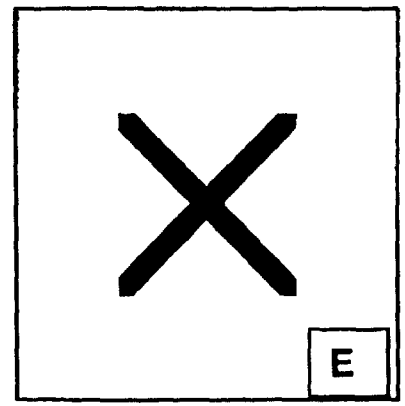
Sensitivity & Accuracy*









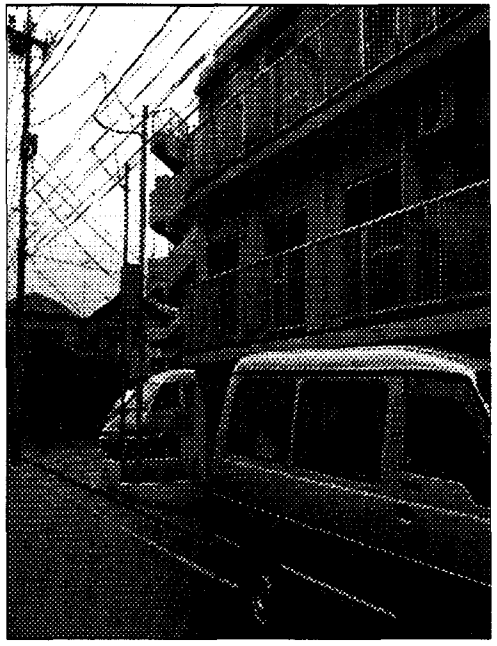


Each location is an independent fix from a cold start

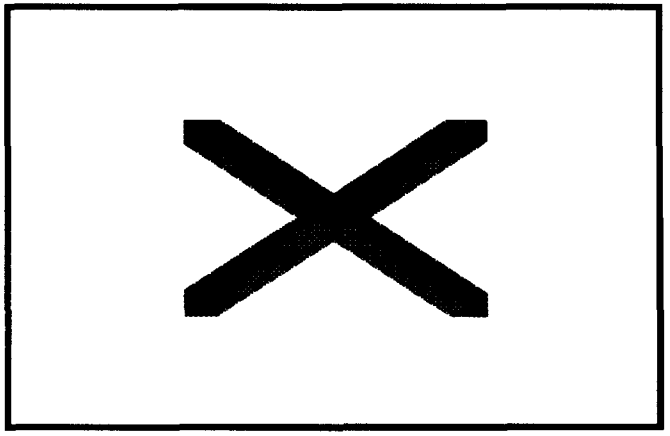
Location	1-sigma (68.3%)	Yield
A. Outdoor, open site	4 meters	100%
B. Sport utility vehicle, antenna by driver's head	17 m	100%
C. 2-story residence, center of basement	20 m	100%
D. 2-story brick office bldg., 1st floor, interior room	22 m	94%
E. Urban Canyon	29 m	100%
F. 50-story glass/steel, 21st floor, 14 ft. from wall	84 m	89%

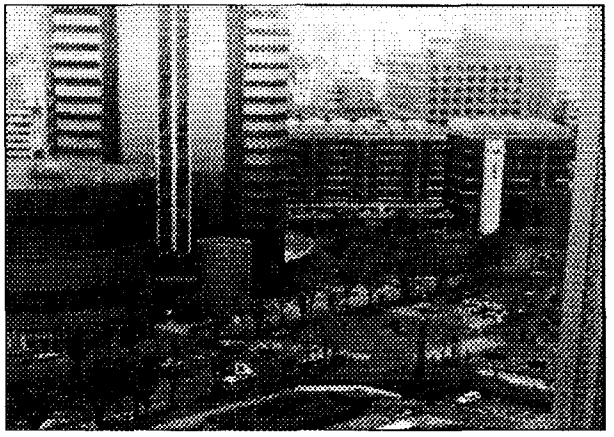
*Testing designed and audited by US WEST Wireless

SnapTrack



Japan Field Testing*





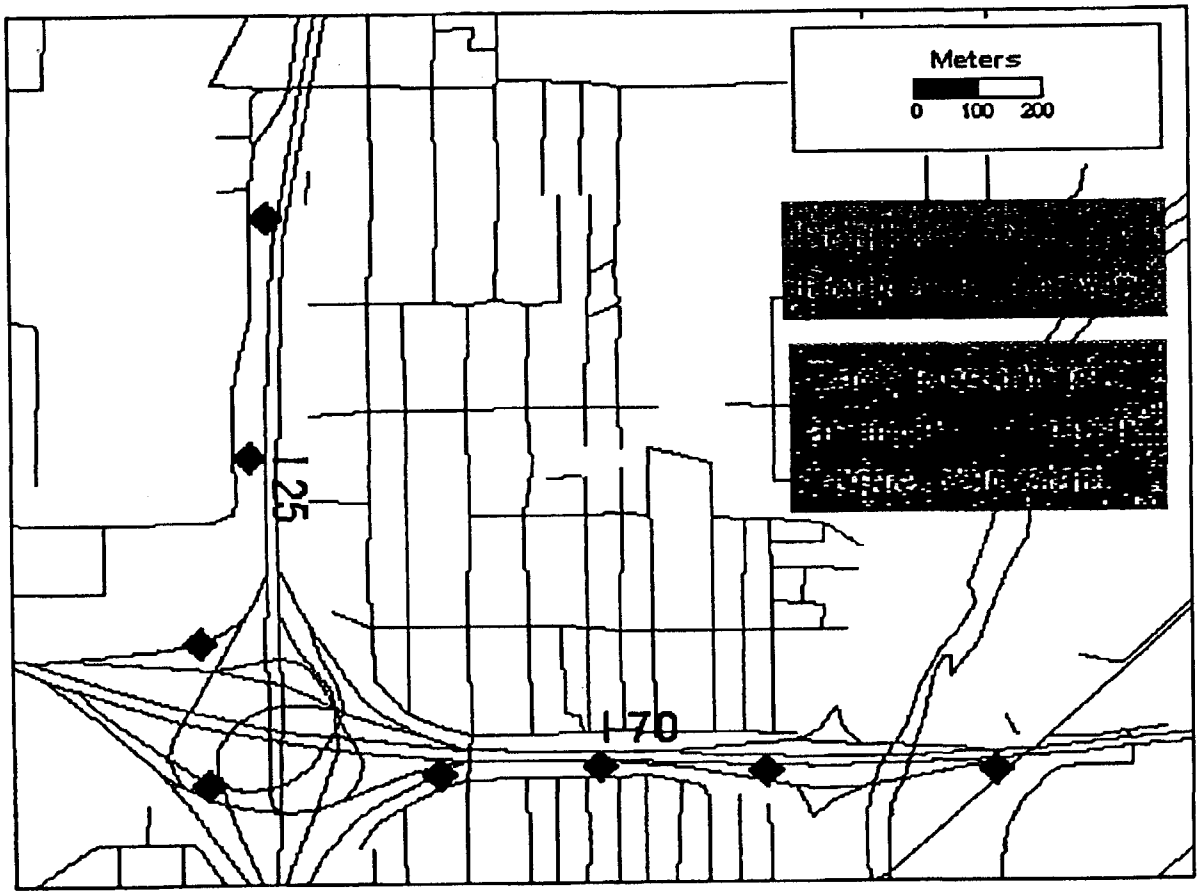
Location	5 point averaging 1-sigma (68.3%)	Yield
Outdoor, Kawasaki Dorm	4 meters	100%
Indoor, Kawasaki Dorm	12 m	100%
Shinbashi	12 m	100%
Inside Coffee Shop	20 m	100%
Ginza	18 m	100%
I-Land Street	44 m	100%

*Testing designed and audited by NTT DoCoMo

SnapTrack

Urban Highway Drive Test*

Antenna Inside Car



*Testing designed and audited by US WEST Wireless

SnapTrack

Exhibit B

EXHIBIT B
Ameritech's Request for Waiver
CC Docket 94-102
February 4, 1999

Number of 911 calls originated within each of Ameritech's cellular market areas for one week:

MARKET	TOTAL CALLS TO 911	ROAMER ORIGINATED CALLS TO 911
Central Illinois	2377	813
Chicago, IL	4291	253
Cincinnati, OH	1241	248
Columbus, OH	1206	361
Detroit, MI	8134	396
Milwaukee/Madison, WI	425	28
St. Louis, MO	3317	265
Indianapolis, IN	12	3